APPENDIX G. ESTIMATING MISSING FLOWS

USGS gage 03342500 on Busseron Creek was used for the load duration analysis but was inactive between December 2, 2003 and May 2, 2007, a period which includes the majority of the available water chemistry samples for the Busseron Creek watershed. Flows during this period were therefore estimated based on flows from the nearby Mill Creek watershed as outlined below.

The Mill Creek watershed was chosen as a "surrogate" gage due to its proximity to the Busseron Creek watershed and its similar hydrologic characteristics. Both watersheds are located in the lower Wabash River watershed (Figure G-1); land use in both watersheds is mostly row crops, pasture and grasslands, and deciduous forest (Table G-1); and both watersheds consist primarily of Group C soils.

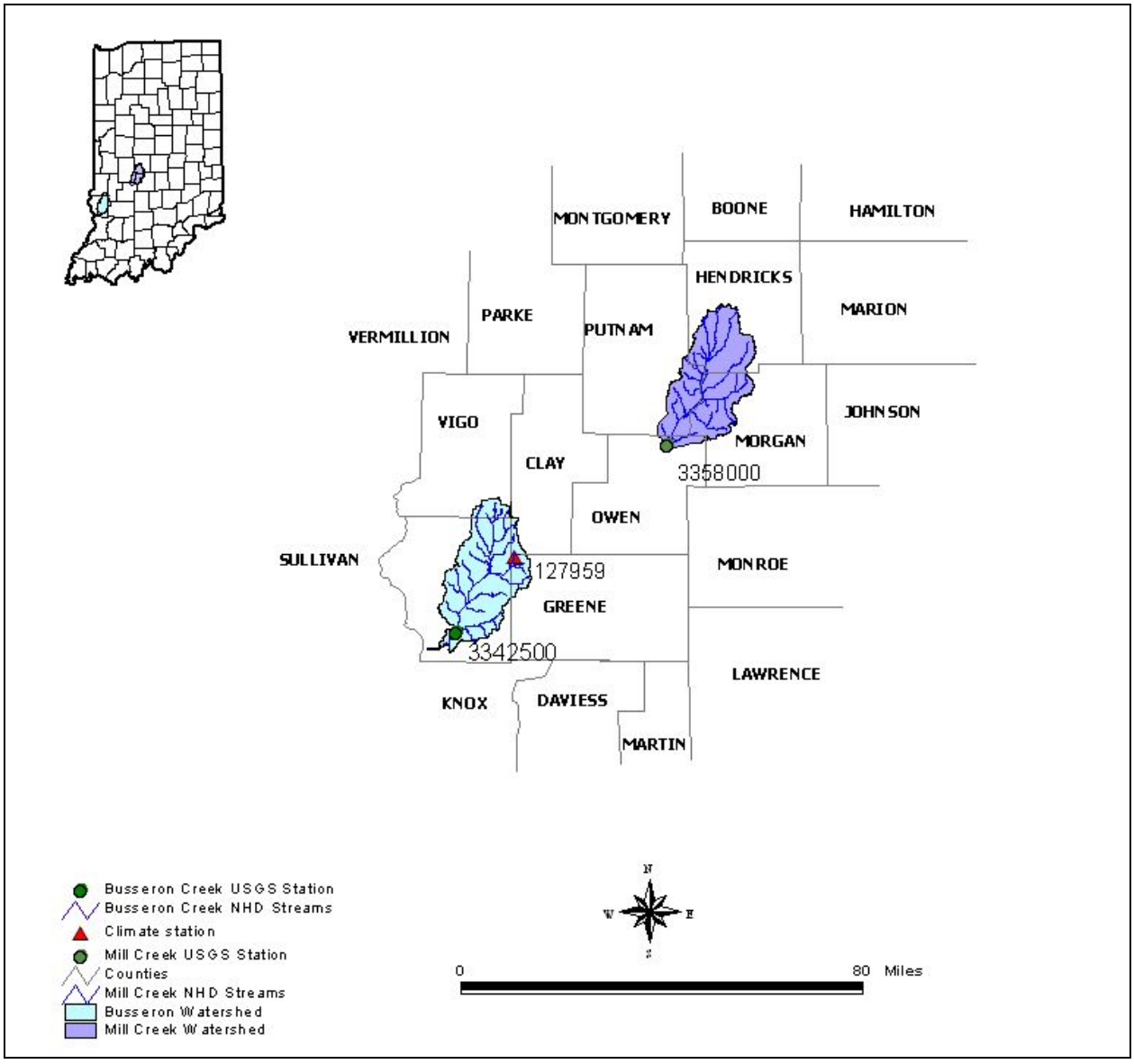

Figure G-1. Location of Climate and USGS flow stations, Mill Creek and Busseron Creek Watersheds.

Table G-1. Land Use and Land Cover Distribution in Busseron Creek Watershed and Mill Creek Watershed.

	Busseron Creek		Mill Creek	
Land Use	**Acres**	**Percent**	**Acres**	**Percent**
Developed	1332	0.88	895	0.58
Urban:high density	486	0.32	60	0.03
Urban:low density	1931	1.27	77	0.05
Agriculture:row crop	66952	44.25	103271	67
Agriculture:pasture and grasslands	30839	20.38	30031	19.51
Deciduous Successional Shrubland	0	0	203	0.13
Deciduous woodland	2371	1.56	579	0.37
Deciduous forest	31312	20.69	17148	11.14
Evergreen forest	1083	0.71	136	0.08
Mixed Evergreen Deciduous forest	1625	1.07	33	0.02
Deciduous forest floodplain and bogs	8263	5.46	910	0.59
Deciduous woodland	119	0.07	9	0.005
Deciduous shrubland	1103	0.72	151	0.098
Herbaceous	300	0.19	177	0.11
Sparsely Vegetated/Unvegetated	16.45	0.01	24	0.015
Water bodies	3604	2.38	149	0.096
Total	**151,343.54**	**100**	**153,853**	**100**

A relationship between the two gages was established based upon a period when they were both active (January 1, 1970 to December 1, 2003). Figure G-2 shows the relationship which was then used to predict the flows at station 03342500 for the missing time period.

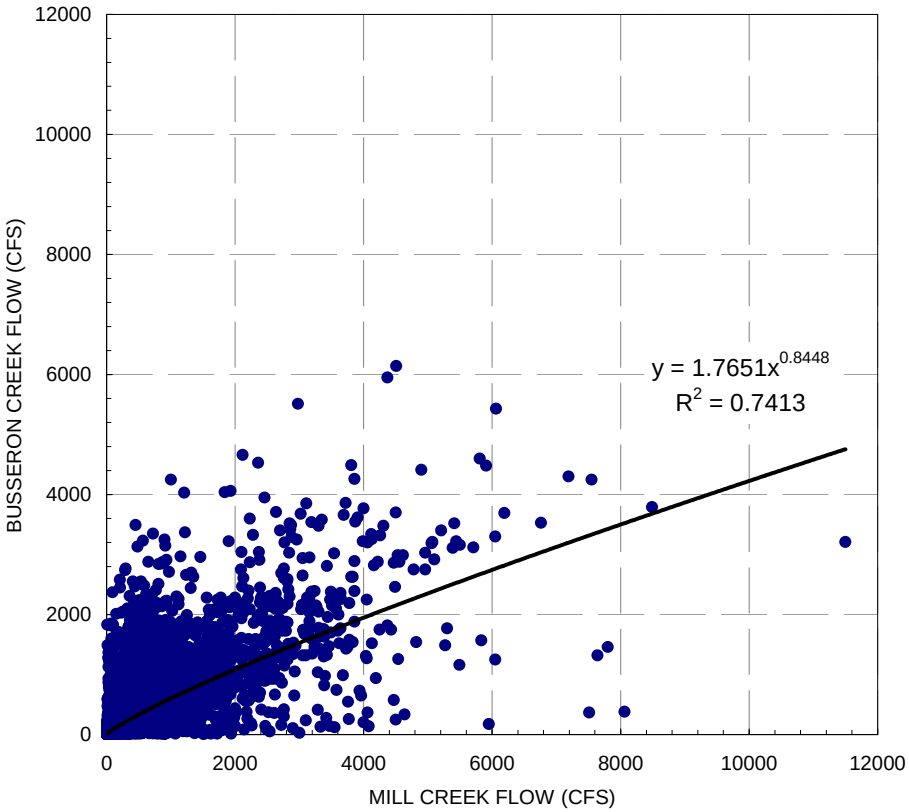

Figure G-2. Regression Analysis for Paired Flows at USGS gages 3342500 and 3358000